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(54) Dispensing device having counting mechanism

(57) A magnet 40 is mounted on a movable member, e.g. pivotal yoke 20, movement of which is associated in each case with delivery of a dosed amount of material by the device. Each time the member 20 moves, the magnet 40 closes a reed switch 43 and a counting impulse is transmitted to a counter 41, preferably having an external digital display. In this way, the total amount of material dispensed can be readily calculated and any discrepancy noted.

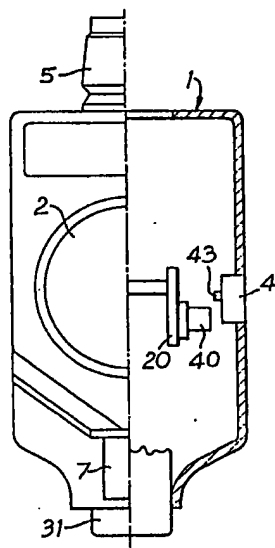


Fig. 3

The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy. The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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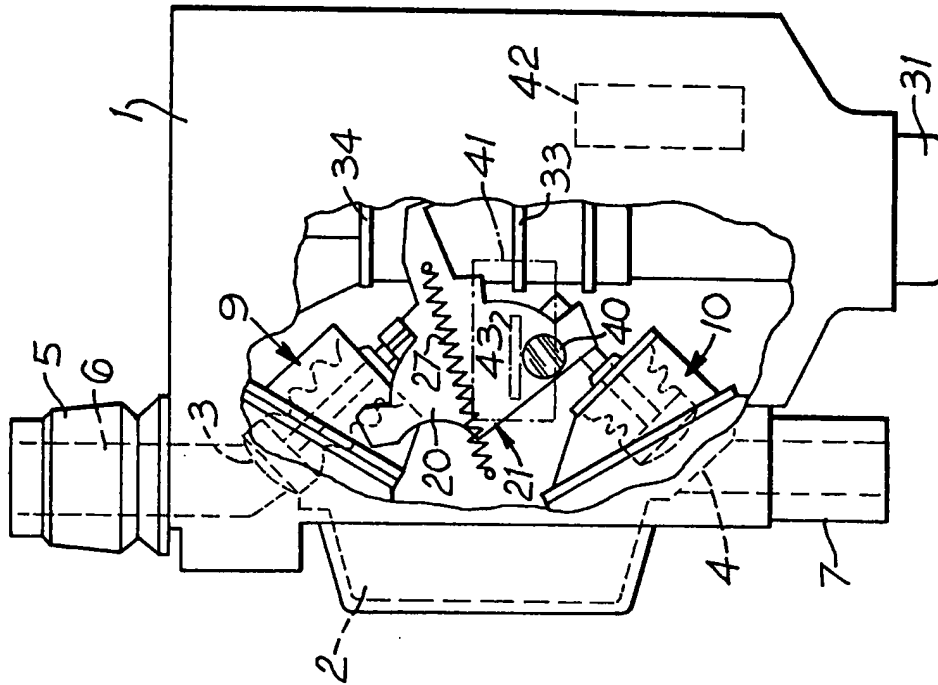


Fig. 2

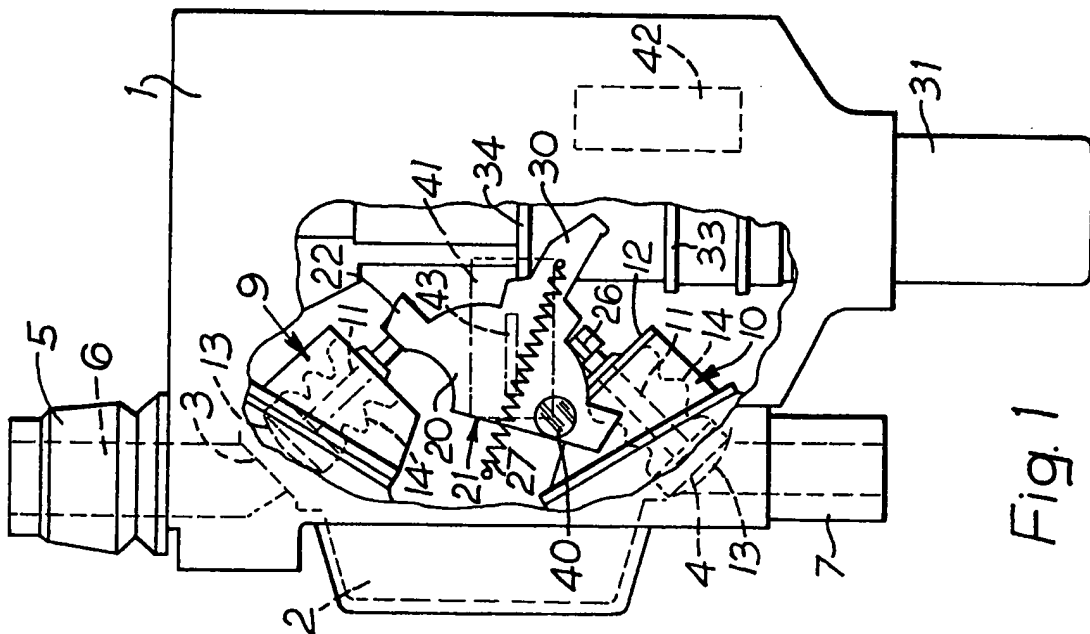


Fig. 1

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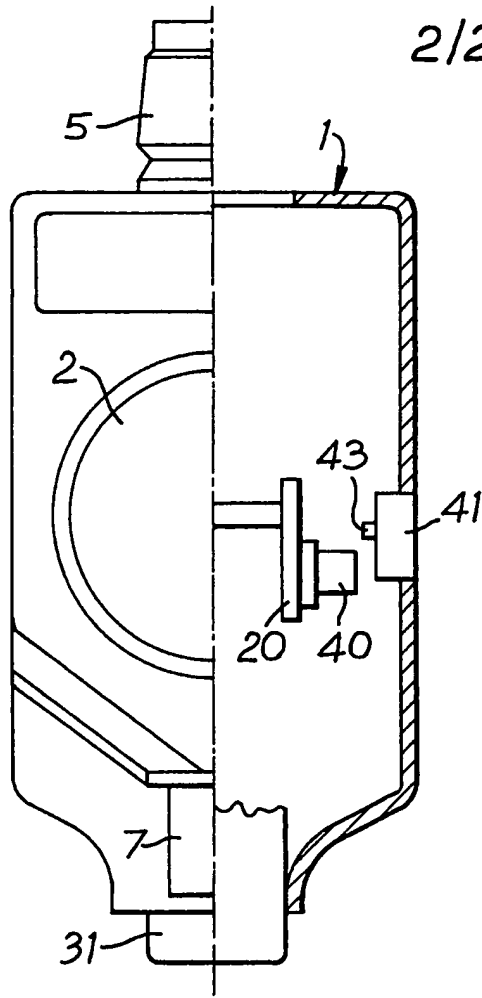


Fig. 3

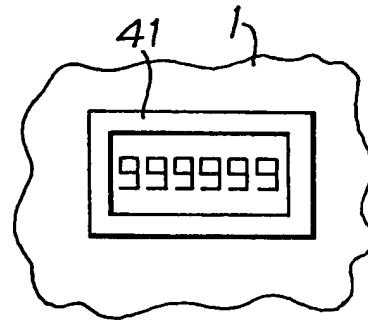


Fig. 4

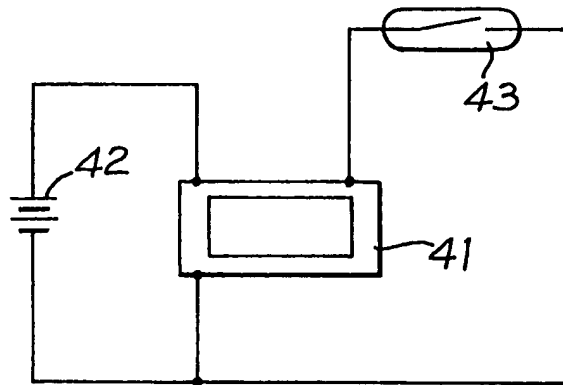
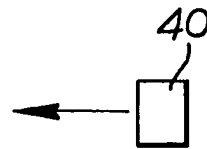


Fig. 5

SPECIFICATION

Dispensing device having counting mechanism

5 This invention relates to a dispensing device having a counting mechanism to count the number of items the device is operated.

In the case of a metered dispensing device, that is to say a device which is designed so as to dispense a
10 pre-determined dosed amount of material upon each operation, it is often desirable to have a counting mechanism of some sort to count the number of times the device is operated. If there is a discrepancy between the total amount of material
15 used up in a given time and the number of times the device has been operated multiplied by the standard dosed amount, this may indicate that the device is not accurately delivering the dosed amount at each operation. However, if the device is known to deliver
20 accurately this may indicate theft or some other irregularity which needs to be investigated further. The foregoing considerations are particularly important where the dispensing device in question is a liquid dispenser, such as a spirit optic, used in an
25 establishment catering to the public.

It is an object of the present invention to provide a counting mechanism for a dispensing device which is simple, accurate, easy to install and not prone to break-down.

30 Pursuant hereto the present invention proposes a dispensing device incorporating a movable member, movement of which is in each case associated with delivery of a measured amount of material by the device, characterised in that a magnet mounted on
35 the movable member acts to close a reed switch and thereby send a count impulse to a counter connected to the switch whenever the member moves close to the reed switch.

The movable member is advantageously a reciprocable member and, preferably, it is in the form of a pivotal yoke as in the metered dispensing device disclosed in British Patent No. 2067516B.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a preferred embodiment of the dispensing device of the invention in the "resting" or "filling" condition, the housing being partly broken away to show some of the internal
50 operating mechanism;

Figure 2 is a view similar to *Figure 1* of the same device in the "operating" or "dispensing" condition;

Figure 3 is a front view, partly in cross-section, of the device shown in *Figures 1* and *2* with only the
55 parts relevant to the present invention shown for the sake of clarity;

Figure 4 is a fragmentary view illustrating the counter which is disposed on one side of the housing of the dispensing device of *Figures 1* to *3*; and
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Figure 5 is a circuit diagram of the counting mechanism of the dispensing device shown in *Figures 1* to *3*.

A preferred embodiment of the dispensing device
65 of the present invention comprises a dispensing

device of the type described in British Patent No. 2067516B with a counting mechanism installed therein. Since the basic operating mechanism of the dispensing device is already described in great detail
70 in the aforesaid earlier patent, a lengthy explanation is not required at present and a brief description only will be given in respect of those parts of the operating mechanism which are necessary for the functioning and understanding of the present proposal.

75 The dispensing device shown in *Figures 1* to *3* is, of course, of the type which is attached to the neck of a bottle so as to dispense measures of liquid from the bottle when it is mounted upside down. Such devices are widely used in hotels, public houses, restaurants and like establishments where alcoholic drinks are dispensed for public consumption.

The device comprises a housing 1 enclosing a metering chamber 2 having an inlet port 3 and an outlet port 4 to allow passage of liquid into and out of the chamber 2 respectively. The inlet port 3 communicates with a resilient plug 5, which is designed to be firmly returned in the neck of a bottle (not shown), via a passageway 6 which also extends
80 right through the plug 5. The outlet port 4 communicates with a tubular discharge nozzle 7.

Separate valves 9 and 10 control flow through the ports 3 and 4 respectively and the valves are interconnected, as will be described, so that only one
85 can be open at anytime. In this particular example each valve 9, 10 comprises a piston 11 which is slideably mounted in a wall 12 projecting from the side of the metering chamber 2 and which has a head 13 providing a resilient sealing cap for engagement with the seating surface of the respective port 3 or 4. Each valve 9, 10 also includes a resilient sleeve 14 located around the piston 11 and extending
100 between the wall 12 and the piston head 13.

The valves 9, 10 are interconnected and controlled by a movable member 20 in the form of a yoke which pivots about a central fulcrum 21 and has oppositely directed arms 22, 23. These arms 22, 23 are located beyond and are engageable with respective projections 26 on the ends of the valve pistons 11 so as to draw back the respective pistons 11 against the action of the sleeves 14 and open the respective valves 9, 10 as the member 20 reciprocates (pivots) between its two extreme positions and the device changes from its filling condition (*Figure 1*) and its
115 dispensing condition (*Figure 2*).

A spring 27 influences the member 20 into one or other of its extreme positions according to whether it is to one side or other of a particular, approximately central pivotal position. This spring 27 is attached to an actuator arm 30 of the member 20 whereby the member 20 is moved from one position to the other by a cylindrical member 31 which is slideable inwardly and outwardly of the housing 1. This cylindrical member 31 has respective abutments or
120 ridges 33, 34 which serve to push the arm 30 up beyond the central pivotal position of the member and to pull it down again respectively as the device is put into its dispensing condition (*Figure 2*) and moves back to its filling condition (*Figure 1*) respectively.
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Thus, starting from the resting or filling condition illustrated in Figure 1, when an operative wishes to dispense a measure of liquid into a container, he places the container under the nozzle 7 and pushes the cylindrical member 31 upwards. The ridge 33 on this member 31 pushes up the actuator arm 30 and pivots the member 20 until, when it passes its central position it continues to pivot under the influence of the spring 27 to the operating or dispensing condition shown in Figure 2. The inlet port 3 is closed by the valve 9 when released by the arm 22 just before the outlet port 4 is opened by the valve 10 being drawn back by the arm 23. The entire contents of the metering chamber then flow through the nozzle into the container before the cylinder 31 drops back sufficiently for the ridge 34 to pull down the arm 30 of the member 20 and return the device to the condition shown in Figure 1 where the outlet port 4 is closed and the metering chamber is refilled from the bottle via the inlet port 3. The cylinder may be suitably delayed in dropping back under its arm weight by means of a doshpot system for example.

This dispensing device is particularly advantageous for two reasons. Firstly it is hygienic since the container itself is not pressed against the device to initiate a discharge of liquid. Secondly it is accurate and not prone to tampering since whenever the dispensing mechanism is actuated the entire contents of the metering chamber is discharged before the device can return to its full condition and there is always sufficient time for the chamber to refill before the dispensing mechanism can be actuated again.

The dispensing device as described so far is already known, but in accordance with the present invention a counting mechanism is incorporated into this device. The counting mechanism includes a permanent magnet 40 mounted on the movable member 20 of the dispensing mechanism, for example by means of adhesive. The mechanism further includes a counter 41 mounted on the side of the housing 1 and connected to a battery 42 and a reed switch 43 by way of a count input circuit as shown diagrammatically in Figure 5. The counter 41 is a small six figure liquid crystal display of the non-reset type having 5 mm high digits readily visible on the exterior of the housing 1, as illustrated in Figure 4. The battery 42 is a 3-volt lithium battery with a ten year life and it is mounted inside the housing 1 as indicated in Figures 1 and 2. The reed switch 43 is fixed to the rear, that is to say the inwardly facing side, of the counter 41, as best seen in Figure 4.

The operation of the counting mechanism will readily be appreciated from the foregoing with reference to the drawings. When the dispensing device is in its resting or filling condition, as shown in Figure 1, the magnet 40 on the member 20 is remote from the reed switch 43 of the counting mechanism, and the reed switch 43 is in its open circuit position. The device is operated to dispense a measure of liquid from the chamber 2 when the cylindrical member 31 is pushed up and causes the member 20 to pivot to the position shown in Figure 2 so as to close the inlet port 3 and open the outlet port 4. As the member 20 pivots to its upper position, the

magnet 40 mounted thereon is brought into close proximity to the reed switch 43, as shown in Figure 2, thereby causing closure of the reed switch to complete the count input circuit. A counting pulse is thus supplied to the counter 41 which increments its numerical display by one. As already explained, the cylindrical member 31 automatically returns to its resting position (Figure 1) and brings the member 20 back to its lower position ready to repeat the cycle again.

The magnet 40 and the reed switch 43 are positioned so that a counting impulse is only transmitted to the counter 41 when the member 20 on which the magnet 40 is mounted is in its extreme upper position, i.e. when it is certain that a full chamber of liquid is being dispensed. Premature activation of the counting mechanism is not possible. It will, of course, be understood that there is no physical contact between the magnet 40 and the reed switch 43 at any stage, it is simply a matter of the reed switch 43 closing when the magnet 40 is brought sufficiently close.

It should also be understood that the foregoing is illustrative and not limitative of the scope of the invention and the actual nature of the counter, the power source, the magnet and the movable member may vary from those specifically described hereinabove.

95 CLAIMS

1. A dispensing device incorporating a movable member, movement of which is in each case associated with delivery of a measured amount of material by the device, characterised in that a magnet mounted on the movable member acts to close a reed switch and thereby send a count impulse to a counter connected to the switch whenever the member moves close to the reed switch.

2. A dispensing device as claimed in claim 1 wherein the movable member is in the form of a pivotal yoke.

3. A dispensing device as claimed in claim 2 wherein the yoke pivots back and forth to open and close valves of outlet and inlet ports respectively of a metering chamber, the valve of the inlet port being closed just prior to opening of the outlet port and the valve of the outlet port being closed just prior to opening of the inlet port.

4. A dispensing device as claimed in claim 2 or 3 wherein the yoke is pivoted by having an actuator arm which is pushed to and fro by respective ridges on a slidable cylinder, one end of which projects out of the device.

5. A dispensing device as claimed in any preceding claim wherein the counter has a liquid crystal display readily visible at the exterior of the device.

6. A dispensing device substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.